

What is Claimed is:

1. A vapor deposited material for FPD protective film comprising a polycrystalline body, sintered body, or single crystal having a surface covered with a fluoride layer.
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2. A vapor deposited material for FPD protective film according to claim 1, wherein said polycrystalline body, sintered body, or single crystal is in the form of a film.
3. A vapor deposited material for FPD protective film according to claim 1, wherein
10 said polycrystalline body, sintered body, or single crystal is formed from one or two or more of oxides selected from the group of MgO, CaO, SrO, BaO, alkaline earth composite oxides, rare earth oxides, and composite oxides of alkaline earth oxides and rare earth oxides.
4. A vapor deposited material for FPD protective film according to claim 1, wherein
15 said fluoride layer is obtained by reacting a fluoridation agent with one or two or more of oxides selected from the group of MgO, CaO, SrO, BaO, alkaline earth composite oxides, rare earth oxides, and composite oxides of alkaline earth oxides and rare earth oxides.
5. A production method of a vapor deposited material for an FPD protective film
20 comprising steps of:
 forming one or two or more of polycrystalline body, sintered body, or single crystal selected from the group of MgO, CaO, SrO, BaO, alkaline earth composite oxides, rare earth oxides, and composite oxides of alkaline earth oxides and rare earth oxides, and
 forming a fluoride layer on the surface of said polycrystalline body, sintered body,
25 or single crystal by surface treatment of said polycrystalline body, sintered body, or single crystal with a fluoridation agent.
6. A production method of a vapor deposited material for an FPD protective film according to claim 5, wherein said fluoridation agent is one or two or more selected from the
30 group of fluorine gas, hydrogen fluoride gas, BF₃, SbF₄ and SF₄.
7. An FPD on which a protective film is formed by using the vapor deposited material for

an FPD protective film according to claim 1.

8. An FPD on which a protective film is formed by using a vapor deposited material obtained from the production method of a vapor deposited material for an FPD protective film according to claim 5.

9. An FPD protective film comprising

a film body formed from one of two or more of oxides selected from the group of MgO, CaO, SrO, BaO, alkaline earth composite oxides, rare earth oxides, and composite oxides of alkaline earth oxides and rare earth oxides on a surface of a substrate, and

a fluoride layer formed on a surface of said film body,

wherein said film body is an aggregate of a plurality of columnar crystallites densely standing on the surface of said substrate, and

said fluoride layer is respectively formed on peripheral side surfaces and top surfaces of said plurality of columnar crystallites.

10. An FPD protective film according to claim 9, wherein said fluoride layer is MO_xF_y (wherein, M is one of two or more selected from the group of Mg, Ca, Sr, Ba, alkaline earth compound metal, rare earth metal and a compound metal of an alkaline earth metal and rare earth metal, and $0 \leq X < 2$ and $0 < Y \leq 4$).

11. An FPD protective film according to claim 9, wherein said fluoride layer is obtained by reacting a fluoridation agent with one or two or more of oxides selected from MgO, CaO, SrO, BaO, alkaline earth composite oxides, rare earth oxides, and composite oxides of alkaline earth oxides and rare earth oxides.

12. An FPD protective film according to claim 11, wherein said fluoridation agent is one or two or more selected from the group of fluorine gas, hydrogen fluoride gas, BF_3 , SbF_4 and SF_4 .

13. An FPD protective film according to claim 9, wherein a ratio (y/x) of a thickness of said fluoride layer (y) to a diameter of said columnar crystallites (x) is from 0.001 to 0.2.

14. An FPD produced by using the protective film according to claim 9.

15. A manufacturing device for FPD protective film comprising:

5 a film formation section for forming a film body on one side of a substrate, and

a layer formation section for forming a fluoride layer on a surface of said film body;

wherein said layer formation section comprises:

a layer formation chamber for housing a substrate on which said film body is formed,

a gas supply mechanism for forming a fluoride layer on the surface of said film body

10 by supplying a fluoridation agent towards said substrate in said layer formation chamber, and

a substrate heating section provided in said layer formation chamber for heating said substrate.

16. A manufacturing device for FPD protective film according to claim 15, wherein said

15 film formation section has a film formation chamber for housing said substrate and a

substrate heating section provided in said film formation chamber for heating said substrate.

17. A manufacturing device for FPD protective film comprising:

a film formation section for forming a film body on one side of a substrate, and

20 a layer formation section for forming a fluoride layer on a surface of said film body;

wherein said layer formation section comprises:

a layer formation chamber for housing a substrate on which said film body is formed,

a treatment dome provided in said layer formation chamber that is pressed against one side of said substrate while maintaining an airtight state, and

25 a gas supply mechanism for forming a fluoride layer on the surface of said film body by supplying a fluoridation agent in said treatment dome.

18. A manufacturing device for FPD protective film according to claim 15, wherein said

film body is formed using one or two or more of oxides selected from the group of alkaline

30 earth oxides, rare earth oxides and composite oxides of alkaline earth oxides and rare earth oxides.

19. A manufacturing device for FPD protective film according to claim 17, wherein said film body is formed using one or two or more of oxides selected from the group of alkaline earth oxides, rare earth oxides and composite oxides of alkaline earth oxides and rare earth oxides.

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20. A manufacturing device for FPD protective film according to claim 15, wherein said film formation section forms said film body on one surface of said substrate using one selected from the group of electron beam vapor deposition, sputtering, ion plating, screen printing, spin coating and spray coating, and said substrate is transferred from said film formation section to said layer formation section by a substrate transfer section.

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21. A manufacturing device for FPD protective film according to claim 17, wherein said film formation section forms said film body on one surface of said substrate using one selected from the group of electron beam vapor deposition, sputtering, ion plating, screen printing, spin coating or spray coating, and said substrate is transferred from said film formation section to said layer formation section by a substrate transfer section.

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22. A manufacturing device for FPD protective film according to claim 20, wherein said substrate transfer section is composed so that said substrate is transferred from said film formation section to said layer formation section without being exposed to the atmosphere.

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23. A manufacturing device of FPD protective film according to claim 21, wherein said substrate transfer section is composed so that said substrate is transferred from said film formation section to said layer formation section without being exposed to the atmosphere.

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24. A manufacturing device for FPD protective film according to claim 15, wherein said film formation section bakes said substrate on which said film body is formed on one surface in air, and said layer formation section forms said fluoride layer on the surface of the film body of this baked substrate.

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25. A manufacturing device for FPD protective film according to claim 17, wherein said film formation section bakes said substrate on which said film body is formed on one surface

in air, and said layer formation section forms said fluoride layer on the surface of the film body of this baked substrate.